

REMARKS

Claims 1-21, 23-35 and 71-78 are pending of which Claims 8-17, 25-31, 35 and 77-78 were withdrawn from consideration. Claims 1-7, 18-21, 23, 32-34, and 71-76 were rejected and Claim 24 allowed. Claims 18 and 23 have been amended. Claim 23 has been amended to change "the" before "roughened surface" to "a" and to add a "," after "the active region". In addition, withdrawn Claim 78 has been amended. No new matter has been added.

Claim Rejections – 35 U.S.C. §102

Claims 18, 32, 33, and 71 and 72 were rejected under 35 U.S.C. §102(b) as being anticipated by Weber et al. (6,364,487) ("Weber"). Reconsideration is requested.

Amended Claim 18 recites "an epitaxial structure comprising an active region sandwiched between an n-type region and a p-type region, the active region configured to emit light when forward biased"; "a non-absorbing polarizer coupled to the active region," and "a randomizing element coupled to the active region and the non-absorbing polarizer, the randomizing element positioned to receive light emitted from the active region before the light is received by the non-absorbing polarizer and to receive light reflected from the non-absorbing polarizer, the randomizing element at least partially randomizes the polarization state of the light".

Applicant submits that Weber does not teach or suggest the claimed "randomizing element". Weber discloses a "light source 80 [that] includes a LED or other light source 81 and a concentrator 82" and a polarizer (DBEF) 83. Col. 4, lines 51-53. Column 4, lines 55-60 of Weber are cited by the Examiner as disclosing the randomizing element. Weber, however, at lines 55-60 of column 4, states that "[the] light of the orthogonal polarization is reflected back into the source and, in turn reflected back onto DBEF 83. The polarization of the reflected light partially changes due to scatter and reflection at the source." Thus, Weber teaches that "the source" is the element that scatters and reflects the light back to the DBEF 83.

While it is unclear whether "the source" referred to in Weber at column 4, lines 55-60, is simply the "LED or other light source 81" or if it is the "light source 80 [that] includes a LED or other light source 81 and a concentrator 82", in either case, "the source" is not the same as the "randomizing element" in Claim 18. Because "the source" referred to in Weber must include the "LED or other light source 81" it cannot be "positioned to receive light

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emitted from the active region before the light is received by the non-absorbing polarizer and to receive light reflected from the non-absorbing polarizer" as recited in Claim 18.

Applicant further points out that element 84 in Fig. 3 of Weber is a quarter wave plate, which is not a randomizing element.

Accordingly, Applicant submits that Claim 18 is patentable over Weber for at least the reasons discussed above. Claims 32 and 33 depend from Claim 18 and are therefore patentable for at least the same reasons. Reconsideration and withdrawal of this rejection is respectfully requested.

Independent Claim 71 recites "a light emitting diode", "a non-absorbing polarizer coupled to the light emitting diode", and "a randomizing element coupled to the light emitting diode and the non-absorbing polarizer".

As discussed above, Weber states that "[t]he polarization of the reflected light partially changes due to scatter and reflection at the source." Col. 4, lines 58-60. Moreover, "the source" referred to is either the "LED or other light source 81" or it is both the "a LED or other light source 81 and a concentrator 82". Col. 4, lines 51-53. In either case, "the source" is not the same as the "randomizing element" in Claim 71 because "the source" in Weber includes the "LED or other light source 81" and therefore cannot be "coupled to the light emitting diode" as recited in Claim 71.

Accordingly, Applicant submits that Claim 71 is patentable over Weber for at least the reasons discussed above. Claim 72 depends from Claim 71 and is therefore patentable for at least the same reasons. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim Rejections – 35 U.S.C. §103

Claims 19-21, 23, 73, and 74 were rejected under 35 U.S.C. §103(a) as being unpatentable over Weber in view of Weindorf et al. (2002/0140880) ("Weindorf"). Reconsideration is requested.

Applicant notes that Claims 19-21 and Claims 73 and 74 depend from respective Claims 18 and 71, discussed above. Weindorf fails to make up for the deficiency of Weber otherwise the Examiner would have maintained the original §102 rejection of these claims from the Office Action dated December 15, 2005. Accordingly, Applicant submits that Claim

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19-21 and 73-74 are allowable for at least the same reasons as Claims 18 and 71, respectively. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 23 recites "A light emitting diode comprising: ...a substrate, wherein a surface of the substrate is a roughened surface that scatters light and that is disposed between the non-absorbing polarizer and the active region, the roughened surface positioned to receive light emitted from the active region and reflected from the non-absorbing polarizer, the roughened surface at least partially randomizes the polarization state of the light." Applicant notes that Claim 23 is amended in the present Response to Office Action in order to change "the" before "roughened surface" to "a" and to add a "," after "the active region".

Neither Weber nor Weindorf teach or suggest a light emitting diode that includes "a substrate, wherein a surface of the substrate is a roughened surface that scatters light and that is disposed between the non-absorbing polarizer and the active region". In fact, the Examiner noted in the Office Action, at page 6, that the substrate 108 of Weindorf "is not part of the LED comprising the active region".

Thus, Applicant submits that Claim 23 is patentable over the combination of Weber and Weindorf. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 34, 75, and 76 were rejected under 35 U.S.C. §103(a) as being unpatentable over Weber, in view of Weber et al. (2001/0036083)) ("Weber '083"). Reconsideration is requested.

Claim 34 depends from Claim 18 and Claims 75-76 depend from Claim 71. Weber '083 does not make up for the deficiencies of Weber as described above. Accordingly, Claim 34 and Claims 75-76 are allowable for at least the same reasons as Claim 18 and Claim 71, respectively.

Moreover, the Examiner asserts that Weber, figures 2 and 3, and column 4, lines 40-67, "discloses a second light emitting diode (inside source 80) ... and a light-combining element disposed in the path of the light emitted by the first light emitting diode ... and the path of the light emitted by the second light emitting diode". Applicant respectfully disagrees.

Weber states "Light source 80 includes a LED or other light source 81". The use of "a" conveys that there is a single light LED, not multiple LEDs. Moreover, the use of the term "light source 81", similarly conveys that there is a single source of light, not

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multiple sources. Thus, contrary to the Examiner's statement, there is no second light emitting diode disclosed in Weber. Moreover, there is no disclosure of a "light combining element" disposed in the path of the light of first and second light emitting diodes.

Should the Examiner disagree with this interpretation of Weber, Applicant requests that the Examiner provide a clear explanation of the rejection including citations to the location within the cited reference for each claim element so that the record will be clear.

Claim 34 recites "a second epitaxial structure", "a second non-absorbing polarizer", "a second randomizing element" and "a polarizing beamsplitter". Claim 75 recites "a second light emitting diode" and "a polarizing beamsplitter" and Claim 76 recites "a second non-absorbing polarizer" and "a second randomizing element". Weber fails to teach or suggest at least these elements and Weber '083 fails to make up for the deficiency. Accordingly, Claims 34 and 75 are patentable for at least these reasons. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Niwa et al. (2002/0031153) ("Niwa") in view of Weindorf. Reconsideration is requested.

Claim 1 recites "a first light emitting diode having an epitaxial structure comprising an active region sandwiched between an n-type region and a p-type region, the active region configured to emit light that is at least 50% polarized along a first polarization orientation when forward biased".

The Examiner cited Niwa at paragraphs 0113-0123 and 0172-0187 as disclosing "a first light emitting diode having an epitaxial structure comprising an active region 6 comprising at least one layer of (1, 1, -2, 0) or (1, 0, -1, 0) InGaN sandwiched between an n-type region 5 and a p-type region 7, the active region 6 configured to emit light that is at least 50%, in fact at least 80%, polarized along a first polarization orientation when forward biased". Applicant disagrees.

Despite a single statement in Niwa that the light emitting device may be a "light emitting diode" at paragraph 0041, Applicant's attorney can only find disclosure in Niwa for a laser device. For example, at paragraphs 0112, Niwa states "hereinafter, the selection of the crystal growth orientation of a quantum-well layer and the adoption of a reflection plane of a resonator in the case of a semiconductor laser device will be more concretely described." The following paragraphs 0114-0120, and 122 all refer only to a "semiconductor laser" and not a

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light emitting diode. Moreover, paragraphs 0117-0120 are related to the resonator, which is used in a laser device, not a light emitting diode.

Additionally, cited paragraphs 0172-0186 are related to Figs. 14 and 15, which are "semiconductor laser devices". See, paragraph 0175 and 0180. The Examiner cited n-type GaN optical guide layer 5 and p-type GaN optical guide layer 7 as being part of the claimed light emitting diode, but these layers are in fact optical guide layers that are used for semiconductor laser devices.

Thus, contrary to the Examiner's statement, Niwa does not disclose "a first light emitting diode having an epitaxial structure comprising an active region 6 comprising at least one layer of (1, 1, -2, 0) or (1, 0, -1, 0) InGaN sandwiched between an n-type region 5 and a p-type region 7...." While Niwa states at paragraph 0041 that the semiconductor light emitting device may be a light emitting diode, this is a non-enabling disclosure and there appears to be no further disclosure of a light emitting diode. As stated in MPEP §2121.01 "The disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation. Elan Pharm., Inc. v. Mayo Found. For Med. Educ. & Research, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003)."

In addition, Applicant submits that a *prima facie* case of obviousness has not been met because there is no suggestion or motivation to combine Niwa with Weindorf, and in fact, Weindorf is at cross purposes with Niwa. The Examiner stated that Niwa discloses a device having an "active region 6 configured to emit light that is at least 50%, in fact at least 80%, polarized." Weindorf, however, includes a diffuser 108 and an enhanced diffuser reflector (EDR) 118, which is described as comprising "a polarization scrambling film that scrambles the polarization of the light and reflects the light toward the diffuser 108." Paragraph [0035]. Thus, Applicant submits that Weindorf conflicts with Niwa because Niwa produces polarized light from the light emitting device, while Weindorf scrambles the polarization of the light.

Accordingly, Applicant submits that there is no suggestion or motivation to combine Niwa's device with the "active region 6 configured to emit light that is at least 50% ... polarized" with Weindorf's device that includes an enhanced diffuser reflector (EDR) 118 "that scrambles the polarization of the light", as the EDR 118 would defeat the polarizing function of Niwa's device.

The Examiner's stated that "it would have been obvious ... to insert Niwa et al.'s LED into the polarized microdisplay such as taught by Weindorf et al. in order to use Niwa et al.'s

LED in a useful device.” In other words, the Examiner is stating that it would be obvious to insert Niwa’s device in Weindorf to use Niwa’s device. Applicant submits that such a conclusory statement does not address the issue of motivation to combine and does not support a *prima facie* case of obviousness. In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002).

The Examiner further stated the motivation of combining Niwa with Weindorf as

Since Weindorf et al. teaches that backlight LCDs are presently being used in hundreds of millions of consumer devices, from telephones to toasters to televisions, that are sold of billions of dollars annually, one would have been motivated to do this because even the slightest commercial advantage that might accrue from this substitution could produce a vast income.

Applicant submits that to the contrary, combining Niwa’s specialized polarized device with Weindorf, which scrambles the polarization state of the light using the EDR 118, would provide a commercial disadvantage. No benefit would be provided by the combination. Additional effort and expense would be required to produce Niwa’s specialized polarized device, and Weindorf’s device, which “scrambles the polarization of the light” using EDR 118, would defeat the polarizing function of Niwa’s device.

Moreover, Applicant’s attorney notes that while the Examiner justifies the combination with a rather colorful description, quoted above, and attributes the statement to the teaching of Weindorf, Applicant’s attorney cannot locate such a teaching in Weindorf. Applicant requests that should the Examiner maintain the present rejection, the Examiner provide a citation for any teaching that is being relied upon for the motivation to combine so that the record is clear.

Thus, Applicant respectfully submits that Claim 1 is patentable over the combination of Niwa and Weindorf. Claims 2-5 depend from Claim 1, and are therefore patentable for at least the same reasons. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 6 and 7 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Niwa in view of Weindorf in view of Weber ‘083. Reconsideration is requested.

Weber ‘083 does not make up for the deficiencies of the combination of Niwa and Weindorf described above. Accordingly, Applicant submits that Claims 6 and 7 are allowable for at least the same reasons as those provided above.

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Moreover, Claim 6 recites "a polarizing beamsplitter" while Claim 7 recites "the first polarization orientation is orthogonal to the second polarization orientation".

The Examiner stated that Weber '083 discloses "two or more polarizers 54 coupled to light emitting diodes c1 through cn-1 (the non-absorbing polarizers 54 transmitting light having polarizations orientations that are orthogonal to each other with a polarizing beamsplitter 55) to combine light having a first polarization orientation and light having a second, orthogonal polarization orientation. Note figure 1 and paragraph 0015 of Weber et al." Applicant's attorney can locate no such disclosure in Weber '083. In fact, Weber '083 discloses the use of dichroic beam splitters and not non-absorbing polarizers. See, paragraph [0010] and [0015]. For example, Weber '083 states "Beam splitter 54 is chosen such that it reflects light around the spectral maximum of array 52 and transmits light of all other visible wavelengths". Paragraph [0015].

Accordingly, contrary to the Examiner's statement, Applicant submits that Weber '083 does not teach or suggest "two or more polarizers 54" Thus, Claims 6 and 7 are patentable for at least these reasons. Reconsideration and withdrawal of this rejection is respectfully requested.

REPLY TO EXAMINER'S RESPONSE TO ARGUMENTS

Despite providing new grounds of rejection, which are addressed above, Applicant's attorney believes that the Examiner has made comments in the Response to Arguments section of the present application that must be addressed.

Regarding Claim 1, at page 12 of the present Office Action, the Examiner remarked that Applicant's statement in the Office Action of 03/15/06 that "Claim 1 is now in condition for allowance" is "a conclusory statement for which Applicant supplies no evidence."

As recognized by the Examiner at page 2 of the present Office Action, Claims 1-5 were not rejected in the previous Office Action (other than the double patenting rejection which was overcome via a terminal disclaimer). Because the Examiner did not provide a rejection of Claim 1, the burden of supporting the claim with evidence or arguments had not shifted to the Applicant, which is what prompted Applicant's attorney's statement that "Claim 1 is now in condition for allowance." That being said, the new rejection of Claim 1 in the present Office Action is addressed above.

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Regarding the Examiner's discussion at page 12 of Applicant's remark on Niwa: as discussed above, Applicant submits that the light emitting diode statement in paragraph [0041] is a non-enabling disclosure. Moreover, Applicant's attorney notes that in the previous Office Action the Examiner also failed to locate and provide a citation to the one occurrence of "light emitting diode" in Niwa at paragraph [0041] out of the 232 paragraphs in Niwa's "Disclosure of Invention".

Regarding the Examiner's discussion of Claim 23 at page 13 of the present Office Action, Applicant's attorney strenuously disagrees. The Examiner stated

"With regard to claim 23, Applicant's statement is untrue. Claim 23 has been re-written into a form that removes a critical limitation from said claim. The version of claim 23 that was indicated allowable required the presence of an LED comprising a substrate, and further required that the surface of the substrate of the LED be roughened. On 3/15/06 Applicant amended claim 23 to remove the requirement of said LED comprising a substrate, and to remove the requirement that the surface of the substrate of said LED be roughened.

(emphasis in original).

Applicant's attorney points out that Claim 23, as amended on 3/15/06, recited "A light emitting diode comprising: ... a substrate, wherein a surface of the substrate is the roughened surface". Thus, the requirements identified by the Examiner as "critical", i.e., an "LED comprising a substrate, and "the surface of the substrate of the LED be roughened" were, in fact, not removed from Claim 23.

Applicant's attorney reasserts that Claim 23 was amended to incorporate the subject matter from which it depended, i.e., Claims 18 and 22. The only language that was removed from Claim 23 was "The apparatus of Claim 22, wherein the apparatus is a light emitting diode that further comprises", but, as discussed above, Claim 23 was amended to recite "[a] light emitting diode comprising".

To be clear, it is noted that the original terms "a randomizing element coupled to the active region and the non-absorbing polarizer" from Claim 18, "the randomizing element is a roughened surface that scatters light" from Claim 22, and "a substrate, wherein a surface of the substrate is the roughened surface that is disposed between the non-absorbing polarizer and the active region" in Claim 23 were combined to recite "a substrate, wherein a surface of the substrate is the roughened surface that scatters light and that is disposed between the non-absorbing polarizer and the active region" in Claim 23.

Thus, Applicant's attorney asserts that contrary to the Examiner's statement, the statement in question in the Response to Office Action dated March 15, 2006, was not untrue and that a fair and accurate reading of the amendment to Claim 23 would have avoided any "waste of the Examiner's time, and of the Office's resources" to which the Examiner refers to at the bottom of page 12.

Claims 18, 23 and 78 have been amended and Claims 1-21, 23-35 and 71-78 remain pending of which Claims 8-17, 25-31, 35 and 77-78 are withdrawn from consideration. For the above reasons, Applicants respectfully request allowance of Claims 1-21, 23-35 and 71-78. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8202.

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